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RECURRENT PNEUMONIA DUE TO AN UNDIAGNOSED BRONCHIAL FOREIGN BODY: A RARE CASE OF BONY FRAGMENT ASPIRATION IN AN ADULT

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SUMMARY
Foreign body aspiration (FBA) is a medical emergency that requires prompt diagnosis and treatment to prevent potentially fatal complications, particularly in cases of complete airway obstruction. While FBA is commonly encountered in pediatric patients, it is rare in adults and often presents atypically, leading to delayed diagnosis. This report highlights a unique case of a 63-year-old adult with recurrent pneumonia caused by an unrecognized endobronchial foreign body. Adult FBA often lacks the hallmark penetration syndrome seen in children, contributing to diagnostic challenges. The most common complications include recurrent pneumonia, bronchiectasis, pulmonary abscess, and granulomatous reactions. Imaging is essential for diagnosis, with chest X-rays detecting radiopaque foreign bodies or indirect signs, while CT remains the gold standard due to its high sensitivity and specificity. This case underscores the importance of maintaining a high index of suspicion for FBA in adults with recurrent or unexplained respiratory symptoms, even in the absence of typical risk factors or events. Early bronchoscopy for diagnosis and removal is essential to prevent complications and ensure favorable outcomes.

INTRODUCTION
Foreign body aspiration (FBA) is a medical emergency that requires immediate attention for diagnosis and treatment. FBA carries a high risk of mortality in cases of complete airway obstruction. However, it can be tolerated and remain undetected, particularly in adults with partial obstruction. Tracheo-bronchial foreign bodies (FBs) inhalation is a very common encounter in clinical practice among pediatric patients and rarely seen among adults.[1]

In adults, the circumstances of onset are usually well-known, such as craniofacial trauma leading to loss of consciousness or inhalation of objects caught in the teeth during DIY activities. When foreign bodies are aspirated in adults, they tend to lodge in the right bronchial tree, whereas in children, they are more likely to lodge in the central airways.[2]

Spontaneous expulsion should neither be expected nor relied upon. Therefore, early removal with a bronchoscope is essential to prevent complications, rather than waiting for spontaneous resolution.[3] Neglecting the removal of endobronchial foreign bodies can lead to complications ranging from simple pneumonia to destruction of lung parenchyma. We report an unusual case of a 62-year-old patient with no known risk factors for foreign body aspiration or symptoms of penetration syndrome. The patient presented with recurrent pneumonia, and the etiological work-up revealed the presence of an unrecognized endobronchial foreign body.

Figure 1: Chest X-ray showing recurrent pneumonia localized in the right pleural recess.

CASE REPORT
The patient was a 63-year-old non-smoker with no associated comorbidities. A thorough history revealed no evidence of penetration syndrome, cranial trauma, or

other factors that might predispose to foreign body aspiration. The patient presented with the third episode of recurrent right basal pneumonia at the same site over the past 12 months, without hemoptysis or deterioration in general condition. The clinical examination was unremarkable.

The frontal and lateral chest X-rays (Figure 1) showed a poorly defined opacity projecting into the right pleural recess. The chest CT (Figure 2) revealed a calcified foreign body in the right lower lobe, surrounded by alveolar consolidation extending into the postero-basal segment.

Bronchial fibroscopy (Figure 3) confirmed the presence of a bony foreign body lodged at the entrance to the basal pyramid, surrounded by inflamed bronchial mucosa and purulent secretions. The patient underwent rigid bronchoscopic extraction of a bone fragment measuring 2 cm × 1.5 cm (Figure 4) and was treated with appropriate antibiotics. Follow-up radiological imaging (Figure 5) showed complete resolution of the previously observed abnormalities.

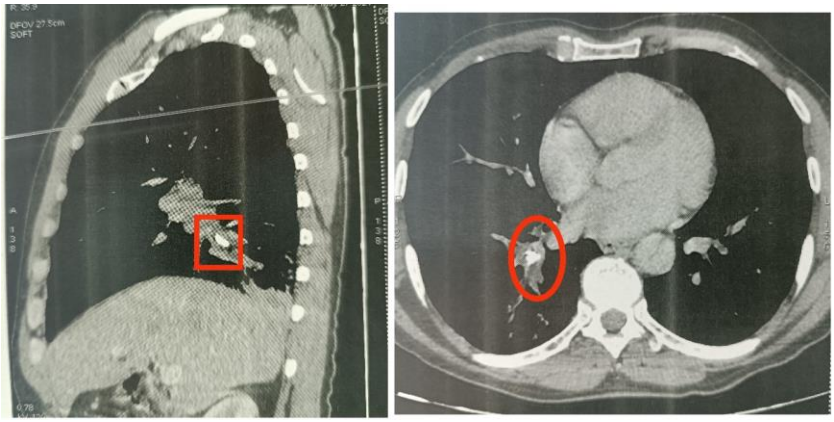

Figure 2: Chest CT showing a calcified foreign body in the right lower lobe, accompanied by alveolar consolidation extending into the postero-basal segment.

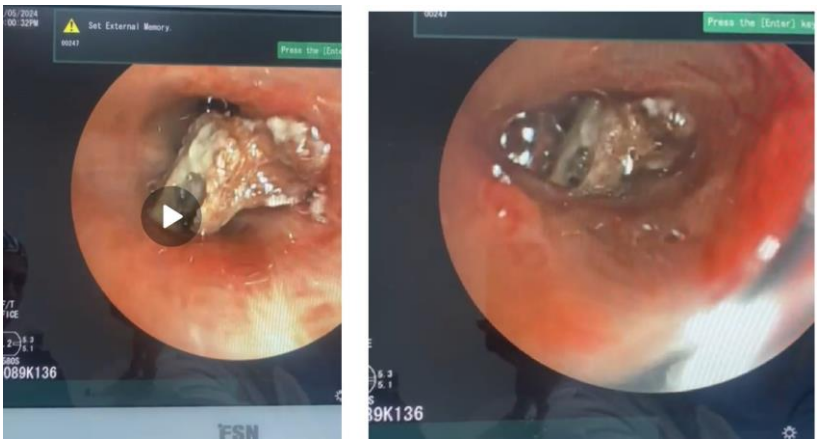

Figure 3: Flexible bronchoscopy revealing a bony foreign body lodged within the lumen of the right basal pyramid.

Figure 4: A bony fragment successfully extracted with the use of a rigid bronchoscope.

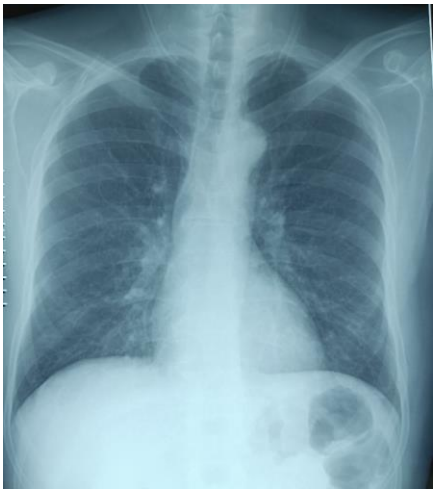

Figure 5: Chest X-ray taken after 2 months, showing complete resolution of the pre-existing opacity.

DISCUSSION

Foreign body aspiration is a relatively common and often catastrophic event in children. Although it can occur at any age, the peak incidence typically occurs between 6 months and 3 years of age.[4,5] It is, however, rare in adults. The clinical presentation of FBA differs between adults and children. The patients usually present with an persistent cough (with or without fever), hemoptysis, chest pain, wheezing, or dyspnea.[6]

The key diagnostic feature of foreign body aspiration (FBA) is the occurrence of penetration syndrome[7], which is characterized by the sudden onset of inspiratory and expiratory bradypnea in a previously healthy individual, accompanied by paroxysmal coughing resembling whooping cough, sometimes associated with cyanosis, retractions, or stridor. However, this syndrome may be absent or go unrecognized for years, leading to delayed diagnosis and less apparent symptoms, particularly in adults, where foreign bodies tend to lodge in the distal bronchi.

In the literature, penetration syndrome is reported in fewer than half of the cases (38%)[8-9] Patients over the age of 65 are less likely to recall the aspiration event, with only 30% providing a history consistent with aspiration prior to undergoing bronchoscopy.[10]

The majority of adult patients with foreign body (FB) aspiration present with clear risk factors, such as neurological impairments leading to swallowing difficulties, altered mental status, neuromuscular disease, intoxication, or iatrogenic causes. Traumatic airway management can lead to aspiration of teeth as well.[11-12] However, it is noteworthy that approximately 10% of adults with FB aspiration have no discernible risk factors.[11-12-13]

The most common complications associated with the presence of a foreign body in the bronchi include obstructive emphysema, frequently accompanied by recurrent pneumonia in the same pulmonary region - as observed in our case report-, bronchopneumopathy with dyspnea, pulmonary abscess, pleuritis, or pneumothorax.[14] Pneumomediastinum is a rare occurrence.[15] In addition to mechanical complications, a foreign body can trigger a granulomatous reaction characterized by the formation of new connective tissue. This response may lead to cartilage destruction, bronchial dilation, fibrosis, and even superinfection of the obstructed area.[16,17]

A chest X-ray should be performed for all patients with suspected foreign body inhalation. It can detect the foreign body if it is radio-opaque, and it may also reveal certain indirect signs, albeit non-specific, findings of atelectasis, hyperinflation, bronchiectasis, or lobar consolidation in the majority of patients.[12-18] In 14–35% of patients, the chest radiograph will be entirely normal.[11-13]

A chest CT is the gold standard imaging modality for suspected foreign body (FB) aspiration. It offers high sensitivity and specificity, providing valuable insights for procedural planning. Additional findings on CT of the chest can include: atelectasis, focal hyperlucency, bronchiectasis, lobar consolidation, tree-in-bud infiltrates, ipsilateral pleural effusion, ipsilateral hilar adenopathy, and thickened bronchial walls.[19-20]

Bronchoscopy, whether flexible or rigid, plays a crucial role in the evaluation and management of bronchial foreign body (FB) aspiration. Flexible bronchoscopy has become the preferred initial procedure for FB retrieval, largely due to its versatility and ability to provide a comprehensive airway survey. With a success rate of about 90% for FB retrieval[13-21-22], it is the go-to option in most cases, particularly in situations involving trauma patients who require neck immobilization. However, rigid bronchoscopy still holds an important place, especially in pediatric patients. Due to the increased risk of complete airway obstruction in children, particularly when a loose FB becomes lodged in the narrow sub-glottic area, rigid bronchoscopy remains the standard of

care.[23-24] Additionally, it is also invaluable in managing significant bleeding, as the rigid bronchoscope allows for tamponade of bleeding in large airways and can accommodate larger tools like suction catheters and bronchial blockers.

CONCLUSION

This case highlights the rarity of foreign body aspiration in adults, particularly in the absence of typical risk factors. Early diagnosis and prompt bronchoscopy are essential to prevent complications such as recurrent pneumonia. Radiological imaging, especially CT, plays a crucial role in identifying foreign bodies and guiding treatment.

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